REMARKS

Status of the claims

Claims 99-102 are pending and have been rejected under 35 U.S.C. § 101.

Rejection under 35 U.S.C. § 101

Claims 99-102 are rejected as allegedly supported neither by a specific and substantial utility, nor by a well-established utility. Applicants respectfully traverse the rejection.

Claims 99-102 are directed to nucleic acids consisting of a nucleotide sequence of SEQ ID NO:12 or 13, or nucleic acids encoding a polypeptide consisting of an amino acid sequence of SEQ ID NO 3 or 4. The nucleic acids encode TCP#2, a polypeptide specifically and preferentially expressed in the taste buds of the tongue. These specific nucleic acid sequence are useful as probes, as described in detail below.

In making this rejection, the Examiner alleges that neither the specification as filed nor the art disclose an activity (*i.e.*, biological function) for TCP#2 proteins and concludes that there is no well established utility for the claimed nucleic acids without the disclosure of an biological function for the polypeptide they encode.

As set forth in MPEP §2107, no rejection based on lack of utility should be made if an applicant has asserted a specific and substantial utility that would be considered credible by one of ordinary skill in the art. In most cases, an applicant's assertion of utility creates a presumption of utility that will be sufficient to satisfy the utility requirement of 35 U.S.C. §101. (*see*, MPEP §2107.02 III A). The Court of Customs and Patent Appeals stated in *In re Langer*:

> As a matter of Patent Office practice, a specification which contains a disclosure of utility which corresponds in scope to the subject matter sought to be patented must be taken as sufficient to satisfy the utility requirement of §101 for the entire claimed subject matter unless there is a reason for one skilled in the art to question the objective truth of the statement of utility or its scope.

In re Langer, 183 USPQ 288, 297 (CCPA, 1974, emphasis in original). To overcome the presumption of sufficient utility as asserted by an applicant, the Examiner must

carry the initial burden to make a *prima facie* showing of lack of utility and provide a sufficient evidentiary basis for the conclusion. In other words, the Examiner "must do more than merely question operability--[she] must set forth factual reasons which would lead one skilled in the art to question objective truth of the statement of operability." *In re Gaubert*, 187 USPQ 664, 666 (CCPA 1975).

In the present case, Applicants have clearly described a specific and substantial utility for the claimed nucleic acids that is independent of the biological function of the polypeptides they encode. As set forth in the present specification and explained in the Declaration of Dr. Zuker under 37 C.F.R. §1.132, the claimed nucleic acids were identified as taste cell-specific polynucleotides and are useful as specific markers for specialized taste buds of the tongue and for generating taste topographic maps (*see, e.g.,* Declaration, ¶¶ 7-9).

cDNAs that encode a taste cell-specific polypeptides were cloned from a taste cell cDNA library. TCP#2 was identified as a rare sequence preferentially expressed in Gustducin-expressing taste receptor cells of the circumvallate and foiliate papillae. (*see, e.g.*, Declaration ¶ 8 and specification at page 8, lines 14-24 and Example 1 at page 54-55). Taste-bud cell specific expression of TCP#2 was confirmed using *in situ* hybridization assays (*see, e.g., id.*)

As attested by Dr. Zuker in his Declaration, it would be apparent to those of skill in the art that TCP#2 is useful as a probe to identify subsets of taste cells (*i.e.*, fungiform cells, folate cells, and circumvallate cells) and specific types of taste receptor cells (*i.e.*, sweet, sour, salty, and bitter) (*see, e.g.*, Declaration, ¶ 9). TCP#2 can also be used in the generation of taste topographic maps that elucidate the relationship between taste cells of the tongue and taste sensory neurons leading to taste centers in the brain (*see, id.*). Such maps are also useful in pharmacological and food industries for customizing taste, *e.g.*, as probes and markers for taste-induced behaviors (*see, id.*).

Thus, Applicants have asserted a specific and substantial utility in the instant specification and have submitted Dr. Zuker's declaration to demonstrate that this asserted utility is credible to one of skill in the art. In contrast, the Examiner has not provided any evidence or objective reason to overcome the presumed patentable utility. In fact, the notion that one of skill

in the art would, at the time this application was filed, find the asserted utility credible has been established by Dr. Zuker's declaration and not yet rebutted by the Examiner.

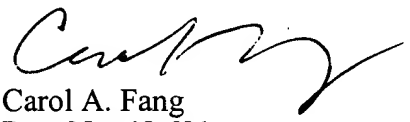
Accordingly, Applicants respectfully submit that the rejection based on alleged lack of utility should be properly withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, the Examiner is invited to telephone the undersigned at 415-576-0200.

Respectfully submitted,



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Attorney Docket No.: 02307E-084210US
Client Ref. No.: 98/122-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Zuker et al. Application No.: 09/361,630 Filed: July 27, 1999 For: NUCLEIC ACIDS ENCODING PROTEINS INVOLVED IN SENSORY TRANSDUCTION Customer No.: 20350	Confirmation No. Examiner: U. Winkler Technology Center/Art Unit: 1648 DECLARATION UNDER 37 C.F.R. § 1.132 OF DR. CHARLES ZUKER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Charles Zuker, Ph.D., being duly warned that willful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. § 1001), and may jeopardize the validity of the patent application or any patent issuing thereon, state and declare as follows:

1. All statements herein made of my own knowledge are true, and statements made on information or belief are believed to be true and correct.

2. I received my Ph.D. from Massachusetts Institute of Technology. I am currently a Professor and Investigator, Howard Hughes Medical Institute, Departments of Biology and Neurosciences, School of Medicine, University of California at San Diego. I have been in this position since 1986. See resume, Exhibit A.

4. The above-referenced patent application claims isolated nucleic acids encoding taste cell polypeptides, in particular TCP#2, a taste bud specific sequence.

5. I am an inventor of the above-referenced patent application. I have read and am familiar with the contents of the patent application. In addition, I have read the Office Action, mailed March 31, 2004, received in the present case. It is my understanding that the Examiner believes that this invention is supported by neither a specific, substantial, and credible asserted utility nor a well established utility as required by the United States Patent Laws.

6. This declaration is provided to demonstrate that, at the time the application was filed, one of skill in the art would recognize the utility of the present invention and would appreciate its real world context.

7. The present application discloses that the claimed nucleic acid, a cDNA, that encodes a polypeptide, TCP#2, that is expressed in taste buds of the tongue, and provides data demonstrating that the claimed nucleic acid is specifically and preferentially expressed in taste bud cells. The present invention is therefore useful, *e.g.*, as a specific marker for specialized taste bud cells of the tongue and for generating taste topographic maps.

8. As described in the present specification, cDNAs that encode taste cell-specific nucleic acids were cloned from an oligo dT primed circumvallate cDNA library (*see, e.g.*, specification at page 8, lines 14-24 and Example 1, page 54-55). TCP#2 was identified as a rare sequence preferentially expressed in Gustducin-expressing taste receptor cells of the circumvallate and foliate papillae (*see, id*). Subsequent *in situ* hybridization assays confirmed the taste bud expression pattern for TCP#2 (*see, id.*).

9. It would be apparent to anyone of skill in the art that TCP#2 is a distinguishing marker for identification of taste bud cells and that TCP#2 has specific and substantial utility as a marker for specialized taste cells of the tongue. As such, TCP#2 is useful as a probe to identify subsets of taste cells (*e.g.*, fungiform cells, folate cells, and circumvallate cells) or specific taste receptor cells (*e.g.*, sweet, sour, salty, and bitter), and for the generation of

taste topographic maps to the elucidate the relationship between taste bud cells of the tongue and taste sensory neurons leading to taste centers in the brain. The topographic maps can also be used in pharmacological and food industries for customizing taste, *e.g.*, as probes and markers for taste-induced behaviors. The Applicants have therefore provided a nucleic acid that encodes a protein with specific expression in a specialized sub-set of cells, *i.e.*, taste bud cells.

10 In view of the foregoing, it is my scientific opinion that one of skill in the art, at the time the application was filed, would immediately recognize the real world utility of the nucleic acids of this invention. Therefore, this invention is supported by a specific, substantial, and credible utility.

Date: 9/20/04 By: _____

Charles Zuker, Ph.D.

CURRICULUM VITAE

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EDUCATION

INSTITUTION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Universidad Catolica de Valparaiso; Chile	B.Sc., Honors	1977	Biology
Massachusetts Inst. of Technology; Boston	Ph.D.	1983	Biology

RESEARCH AND/OR PROFESSIONAL EXPERIENCE

1993 - present	Professor and Investigator; Howard Hughes Medical Institute Departments of Biology and Neurosciences, School of Medicine University of California, San Diego
1989 - 1992	Associate Professor and Associate Investigator Howard Hughes Medical Institute, UCSD
1986 - 1989	Assistant Professor; Department of Biology, UCSD
1983 - 1986	Postdoctoral Fellow; Department of Biochemistry; University of California, Berkeley
1977 - 1983	Graduate Student; Department of Biology; Massachusetts Institute of Technology

Honors and Keynote Lectures (selected)

Whitaker Health Sciences Fund Fellow, Massachusetts Inst. of Technology, 1979-1980
Whitaker Health Sciences Fund Fellow, Massachusetts Inst. of Technology, 1981-1982
European Molecular Biology Organization Fellow, 1983
Jane Coffin Childs Memorial Fund for Medical Research Fellow, 1984-1986
McKnight Foundation Fund for Neuroscience Award, 1988-1991
Monsanto Speaker, St. Louis University, St Louis, MO, 1991
Broadhurst Foundation visiting lecturer, Cambridge, MA, 1991
Institute Speaker, Scripps Research Institute, La Jolla, CA, 1992
Keynote speaker, Stanford Neurosciences Program Retreat, Monterey, CA,1992
Pew Scholars Award, 1988-1992
Alfred P. Sloan Award in Neurosciences, 1988-1990
March of Dimes Basil O'Connor Award, 1989-1991
Merck Lecturer, UC Berkeley 1992
Institute speaker, Roche Institute of Molecular Biology, Nutley, NJ, 1993
Keynote Speaker, Pharmacological Sciences Program, Vanderbilt University, Nashville, TN, 1994
Keynote Speaker, Stanford Medical Scientist Training Program, Stanford University CA, 1994
Lecturer in the Life Sciences, Northwestern University Medical School, Chicago, IL 1994

Howard Hughes Medical Institute, Lecture series to Institute employees, Howard Hughes Medical Institute, Chevy Chase, MD, 1996
Keynote Speaker, FASEB Summer Conference on "The Biology and Chemistry of Vision", Keystone, CO, 1997
Keynote Speaker, U. Penn Graduate programs in Biochemistry, Molecular Biology and Pharmacology. Philadelphia, 1998
Cogan Award, Association for Research in Vision and Ophthalmology, 1998
University Lecturer, UT Southwestern Medical School, 1999
Alcon Award for outstanding contributions to vision research, 1999
American Academy of Arts and Sciences, 2000

Study Sections and Advisory Boards (selected):
Member, Scientific Advisory Board, Pew Latin American Scholars Program, 1990 - present
Mechanisms of Development, 1991-present
Neuron, 1995-present
Member, American Cancer Society Postdoctoral Research Selection Committee, 1995-1999
Member, Scientific Advisory Board, Schepens Research Institute, Harvard University, Cambridge, MA, 1995 - present
Member, Review Panel, Howard Hughes Medical Institute International Grants Program, 1996
Member, National Research Council/ National Academy of Sciences advisory committee for the US and HHMI program in Latin America, 1997-
National Advisory Committee of The Pew Scholars Program in the Biomedical Sciences, 1997-
Member, NIH Visual Sciences C study section, Bethesda, MD, 1997-2000
Member, NIDCD Strategic Planning committee 1999-
Damon Runyon-Walter Winchell Cancer Fund Scientific Advisory Committee, 1999-
Current Biology, 2000-
Steering Committee, Alliance for Cellular Signaling, 2000-
Advisory board, Pew program in Science and Society, 2001-
Advisory board, NIH-wide initiative on mouse mutagenesis, 2001-

Publications (selected):

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Smith, D. P., R. Ranganathan, R. W. Hardy, J. Marx, T. Tsuchida, and C. S. Zuker (1991). Photoreceptor deactivation and retinal degeneration mediated by photoreceptor-specific protein kinase C. Science *254*: 1478-1484.

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